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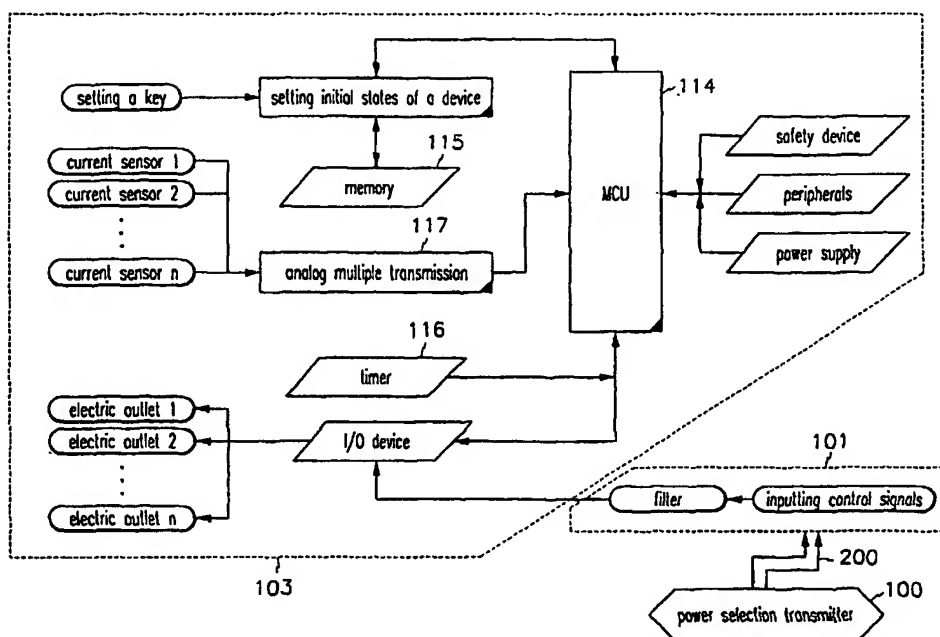
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(54) Title: **POWER SAVING OUTLET DEVICE THAT ALLOWS REMOTE CONTROL**



(57) Abstract: Disclosed is a power saving and remotely controllable electric outlet for interrupting power supplied to a electric device in pause mode which comprises: a power gate connected to a plug of the electric device, accommodating a plurality of plugs, for interrupting power supplied to the electric device according to an external signal; a power selection receiver, wire or wirelessly connected to the power gate, for transmitting the external signal to the power gate; and a power selection transmitter for transmitting the external signal to the power selection receiver.



*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## Power Saving Outlet Device that Allows Remote Control

### **BACKGROUND OF THE INVENTION**

#### 5      **(a) Field of the Invention**

The present invention relates to an electric outlet for interrupting power supplied to an electric device in pause mode through remote control. More specifically, the present invention relates to a power saving and remotely controllable electric outlet for supplying power to an electric device  
10      or interrupting the power by remote control.

#### **(b) Description of the Related Art**

Electric devices used in houses, business sections, offices, factories, etc. vary greatly and are classified into many categories, and they use many outlets.

15      However, since power is continuously supplied to the electric devices when they are not in use, great energy loss occurs nationwide.

To solve this problem, multiple power-interrupt electric outlets have been manufactured, but since users have to manually handle them, they have not been popularized because of inconvenience.

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### **SUMMARY OF THE INVENTION**

It is an object of the present invention to provide a power saving and remotely controllable electric outlet for automatically interrupting power when an electric device is not used, and supplying power when the electric device

is used according to simple remote manipulation.

In one aspect of the present invention, a power saving and remotely controllable electric outlet for interrupting power supplied to an electric device in pause mode comprises: a power gate connected to a plug  
5 of the electric device, accommodating a plurality of plugs, for interrupting power supplied to the electric device according to an external signal; a power selection receiver, wire or wirelessly connected to the power gate, for transmitting the external signal to the power gate; and a power selection transmitter for transmitting the external signal to the power selection receiver.

10 The power gate comprises: a timer for setting On/Off time and controlling a plurality of power sources; a current sensor for detecting current variation of the electric device; a power driver for driving the electric device; a safety device for controlling current overflow to protect the electric device from fire; and a microcomputer for controlling the above-noted components.

15 The microcomputer comprises a memory for storing initial setting values of the electric devices, and a main controller unit for processing the values stored in the memory.

The power selection receiver respectively distinguishes signals transmitted by the power selection transmitter according to initial setting  
20 values, and is configured to be receive-only or receive-and-transmit according to signal setting values.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate an embodiment of the invention, and, together with the description, serve to explain the principles of the invention:

FIG. 1 shows a power saving electric outlet according to a preferred embodiment of the present invention;

FIG. 2 shows a configuration of a power saving electric outlet according to a preferred embodiment of the present invention; and

FIG. 3 shows an operation of a power saving electric outlet according to a preferred embodiment of the present invention.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

In the following detailed description, only the preferred embodiment of the invention has been shown and described, simply by way of illustration of the best mode contemplated by the inventor(s) of carrying out the invention. As will be realized, the invention is capable of modification in various obvious respects, all without departing from the invention. Accordingly, the drawings and description are to be regarded as illustrative in nature, and not restrictive.

FIG. 1 shows a power saving electric outlet according to a preferred embodiment of the present invention, FIG. 2 shows a configuration of the power saving electric outlet, and FIG. 3 shows an operation of the power

saving electric outlet.

The electric outlet comprises a power selection transmitter 100, a power selection receiver 101, and a power gate 103.

As shown in FIGs. 1 and 2, the power selection transmitter 100  
5 transmits instruction signals to a main controller unit (MCU) 114 so that the MCU 114 may select a desired device and drive the same. Here, the transmission of the instruction signals is executed via a wireless communication device 200 that includes an originator supporting short-distance wireless remote control methods such as the infrared data  
10 association (IrDA) method, the radio frequency (RF) method, the Bluetooth method, and the microwave method.

The above-noted communication methods are applicable to all remote control methods used for electric and electronic devices. Any remote control method for electronic or electric device can be applied to the present  
15 invention.

For example, a remote control method for electric home appliances can be applied to the present invention. Therefore, no specific remote control method or system is needed to operate the outlet device of the present invention.

20 The power selection receiver 101 receives wireless data from the power selection transmitter 100, converts them into digital signals, and transmits them to the power gate 103. The power selection receiver 101 can be receive-only or receive-and-transmit.

Also, the wireless data include all signals transmitted by the power selection transmitter 100, classified according to wireless communication methods, and the power selection receiver 101 transmits signals identical with those transmitted by the power selection transmitter 100 with a predetermined time delay according to a transmission function.

The transmission function modifies the power selection transmitter's continuous twice operation into a single operation, and generates signals identical with those of the power selection transmitter 100 so as to prevent interference with other devices.

The power gate 103 analyzes the instruction signals transmitted by the power selection transmitter 100, searches the data stored in a memory 115 so as to operate a corresponding device, finds a code and a frequency matched with those input at an initial setting, and turns on the corresponding device.

In the above operation, when the current is varied by more than a predetermined level while a corresponding device is operating at a rated power, a current monitoring function determines this as the device's turning off and automatically cuts the power at a terminal of a plug.

The power gate 103 comprises a software unit and a hardware unit. The software unit processes power-saving and easy-use functions of the power devices such as a storing function of (setting devices) the codes and frequencies of the power selection transmitter 100, a timer function, a function of automatic and manual selection, and a function of monitoring the

used power.

The hardware unit comprises a current sensor, a power device, a microcomputer and a safety device.

The power gate 103 may have one of such a type as multi-socket  
5 connected to a cord, multi-socket without a cord, or reclamation type that can be reclaimed on a wall, a ceiling, or a floor. The multi-socket connected to a cord type power gate 103 may be attached to a wall or a floor. The multi-socket without a cord type power gate 103 may directly be connected to an electric outlet or may indirectly be connected to an electric outlet via an  
10 extension cord. The reclamation type power gate 103 may be installed to replace the existing reclamation type outlet or may be separately reclaimed to be connected to the existing reclamation type outlet through a wire.

To set the code and the frequency component of the power selection transmitter 100, the user presses a setting button provided on the power  
15 gate 103, points the power selection transmitter 100 (e.g., a remote controller) in the direction of the power selection receiver 101, selects a power switch or another switch available to the user, repeatedly presses it, and when the power selection receiver 101 recognizes the signal, a lamp is set to be tuned on, and when the lamp is tuned on, corresponding  
20 information is stored in the memory 115.

The timer function is operated when the user sets the On/Off time of a timer 116, and it is configured to control a plurality of power sources through a single timer 116. The time is established through an external soft



key or a remote controller.

As to the automatic and manual selection function, the automatic mode is switched to the manual mode when the remote control function is canceled or cannot be operated because of malfunction or other problems.

5 An operation at the manual mode is identical with general operation states.

An operation of the present invention will now be described referring to a drawing.

FIG. 3 shows a flowchart of an operation of a power-saving electric outlet according to a preferred embodiment of the present invention. When  
10 the power is initially supplied, the established timer and the external signals are continuously monitored, and a main program is operated in step S104.

When the On/Off time is set according to the devices during operation, the On/Off control is executed on the devices at corresponding times. The main program monitors the current of the turned-on devices in  
15 step S105 and, in the case of an over current or a low current caused by abrupt changes of the current, the main program interrupts the devices' power.

Also, when an external signal is detected and an interrupt is required, the main program analyzes a control signal in step S106, and finds a  
20 corresponding signal previously stored in a memory in step S107.

When the corresponding signal is not found, an error state is displayed in step S108, and the control signal is read again. Inputting of signals is repeated many times, and when no signal is provided, it goes to

the main program. When a control signal is found, it goes to the first step S109 or the second step S110 according to a setting operation mode.

In the first step S109, the corresponding device is turned on, and after a predetermined time delay in step S111, an identical signal is generated to turn on the main power of the device.

In the second step S110, power is supplied to the corresponding device in step S112, and the main power of the device is turned on when the user again presses the power switch.

In step S113 of setting the control signal, when the user presses a corresponding value, and repeatedly presses a power switch of an originator to be set, or a desired switch, the MCU 114 recognizes this, and displays a completion signal after the recognition.

The above-described operation steps go to the main program 104 after finishing the respective steps.

As described, the present invention remotely interrupts the remaining current supplied to the electric devices in pause mode so as to fundamentally reduce or interrupt standby power supplied when the devices are not in use, thereby obtaining economic gains.

While this invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the

appended claims.

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**WHAT IS CLAIMED IS:**

1. A power saving and remotely controllable electric outlet for interrupting power supplied to an electric device in pause mode, comprising:

a power gate connected to a plug of the electric device,  
5 accommodating a plurality of plugs, for interrupting power supplied to the electric device according to an external signal;

a power selection receiver, wire or wirelessly connected to the power gate, for transmitting the external signal to the power gate; and

a power selection transmitter for transmitting the external signal to  
10 the power selection receiver.

2. The electric outlet of claim 1, wherein the power gate comprises:  
a timer for setting On/Off time and controlling a plurality of power sources; a  
current sensor for detecting current variation of the electric device; a power  
driver for driving the electric device; a safety device for controlling current  
15 overflow to protect the electric device from fire; and a microcomputer for  
controlling the above-noted components.

3. The electric outlet of claim 2, wherein the microcomputer  
comprises a memory for storing initial setting values of the electric devices,  
and a main controller unit for processing the values stored in the memory.

20 4. The electric outlet of claim 1, wherein the power selection  
receiver respectively distinguishes signals transmitted by the power selection  
transmitter according to initial setting values, and is configured to be receive-  
only or receive-and-transmit according to signal setting values.

5. The electric outlet of claims 1 to 4, wherein the power gate has one of such a type as multi-socket connected to a cord, multi-socket without a cord, or reclamation type that can be reclaimed on a wall, a ceiling, or a floor.

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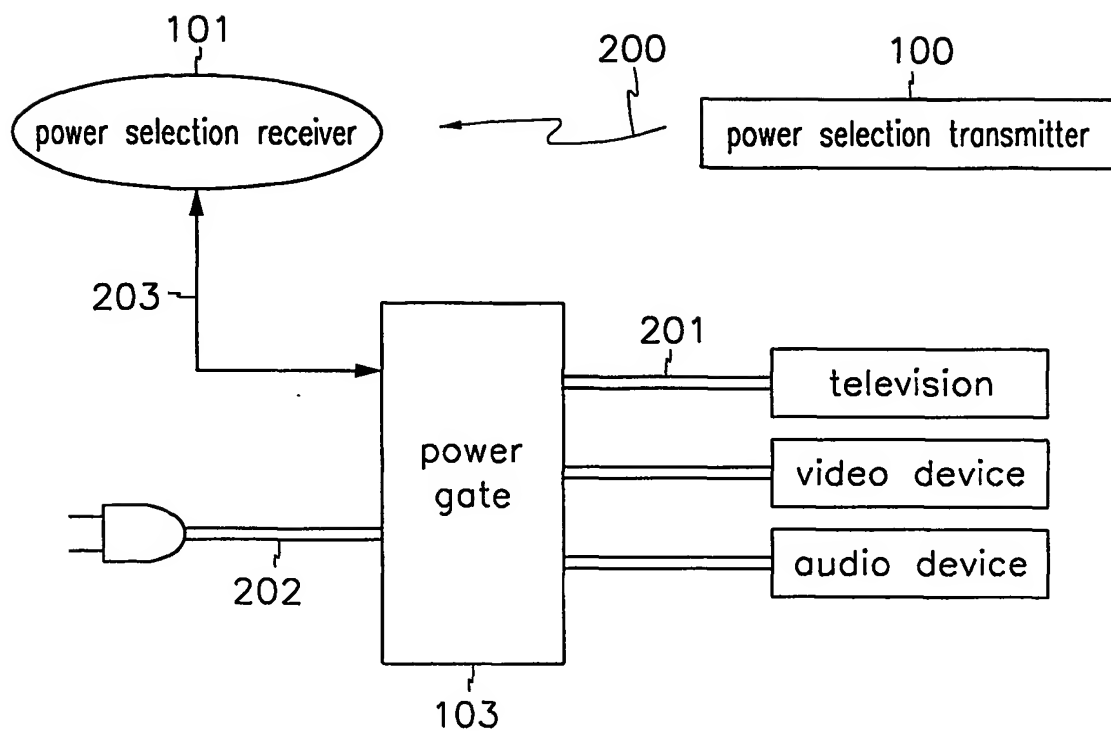
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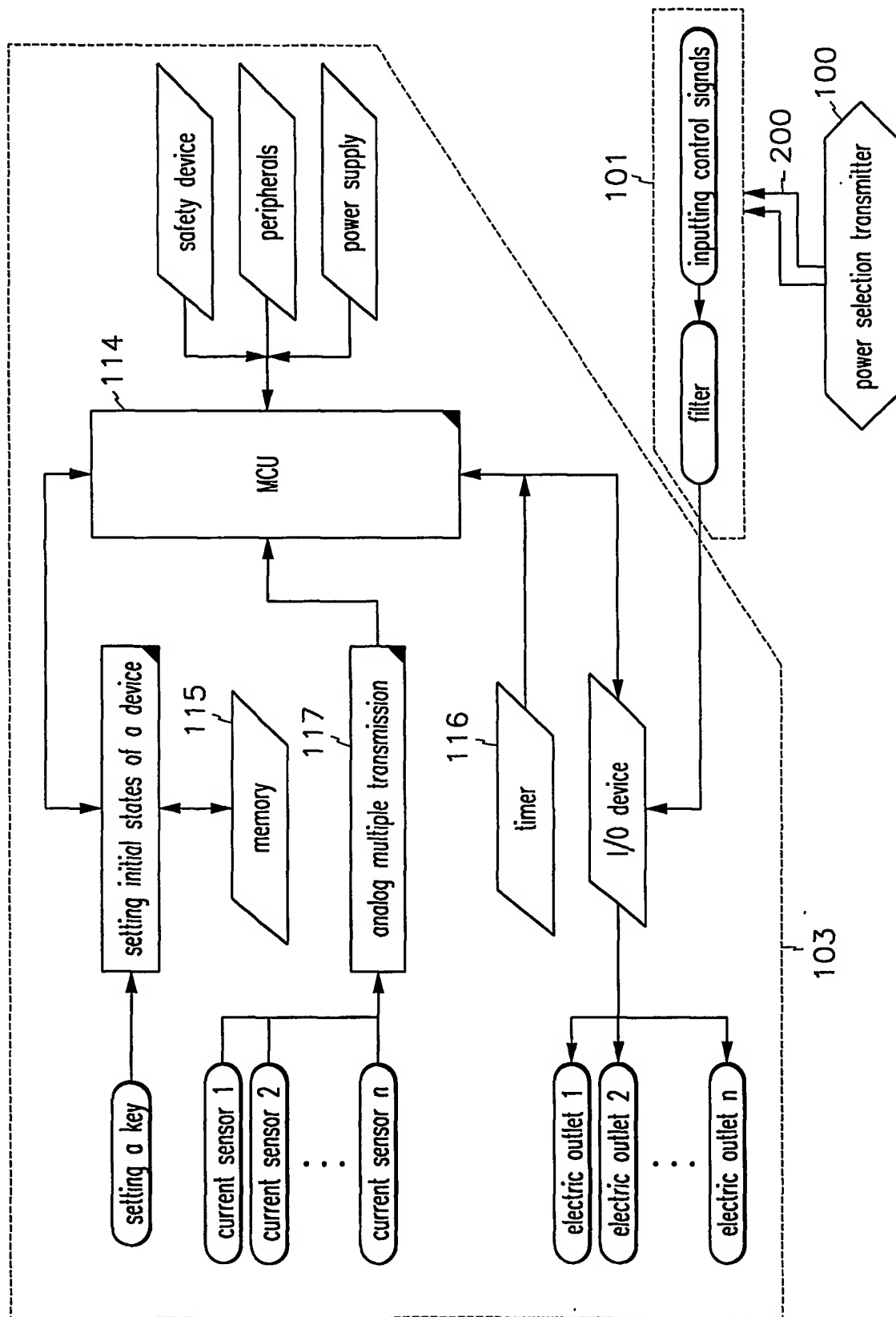
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FIG.1



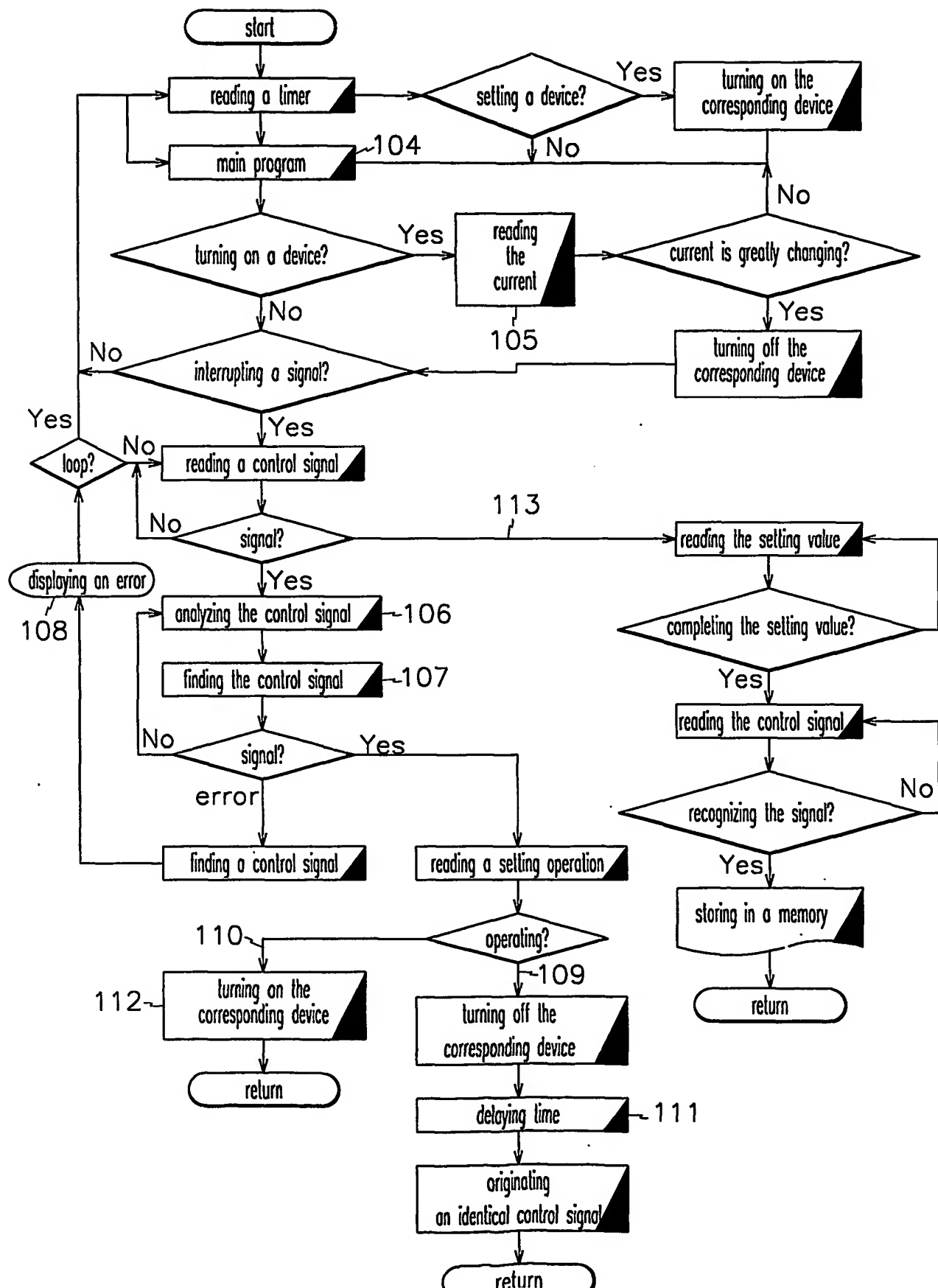
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FIG.2



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FIG.3





## CLASSIFICATION OF SUBJECT MATTER

IPC<sup>7</sup>: H02J 13/00, H04N 5/63

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>7</sup>: H02J, H04N, H02M, G05F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2000 078751 A (CANON INC) 14 March 2000 (14.03.00)	1
A	<i>Patent Abstracts of Japan (CD-ROM).</i>	2,3
X	DE 19721788 A1 (OHMIE) 26 November 2029 (26.11.29) 98	1
	<i>column 1, lines 2-14.</i>	
X	US 4977515 A (RUDDEN et al.) 11 December 1990 (11.12.90)	1
A	<i>column 2, lines 3-34, claims 1-4.</i>	2-4
A	EP 0804026 A2 (DEUTSCHE THOMSON BRANDT GMBH)	1,2
	29 October 1997 (29.10.97)	
	<i>claim 1.</i>	
A	US 5442336 A (MURPHY et al.) 15 August 1995 (15.08.95)	1-4
	<i>claims 1,2.</i>	
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☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

## \* Special categories of cited documents:

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..&amp;.. document member of the same patent family

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 02/00282-0

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
DE	A1	19721788	26-11-1998	none	
JP	A2	00078751	14-03-2000	none	
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